Information Transfer

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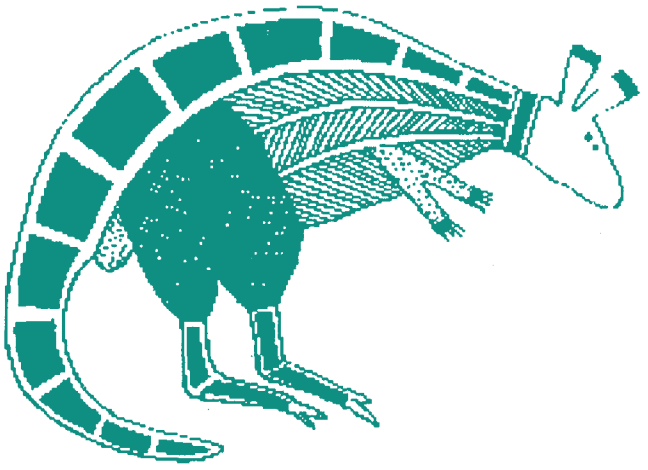

Merry Christmas!

Happy New Year!

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Editorial

As 1992 draws to a close we can sit back and consider that for the CEG it has been a year well spent.

The high point of the year once again must be the State Conference, but there are other events worth noting. In particular the beginning of an ambitious and on-going Inservice program, with programs for Early Childhood, Technology, LOGO and Computing Studies.

For our country members, Ken Mascord ran a "West of the Mountains" Computing Studies miniconference which was highly successful.

Chris Taylor of Bilgola Plateau Primary was named Computer Educator of the Year.

The International Space Year competition attracted over fifty entries.

CEG Directors sat on various State and Federal Departmental committees, representing you, the members, in attempting to get a more realistic and equitable implementation of information technology.

Finally, throughout the year the Directors worked, via the monthly meetings and various sub-committees, to 'fine tune' the running of the CEG, assisting office bearers via hardware and software purchases to do their jobs more efficiently. Remember that all the Directors are volunteers, and all have had many more demands on their time made this year- as have all teachers.

Whatever we have been involved in, we essentially do it because we like to, and we all want to give the kids in our care the best opportunities we can.

But isn't it nice to have a rest! I don't know about you, but I intend to do some sailing, on a catamaran that gets too wet to keep a computer on board, or a mobile phone, or any other technology more complex than a block & tackle!

Have a Merry Christmas and a safe vacation.

Neville Fraser

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Your Contributions, whether they are letters, photographs, reviews, articles or ideas are welcome.
Send them to the above address.

Your ideas and comments are eagerly awaited.

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Computers Don't Discriminate

-or do they?

Susan Hedgecoe, Ermington Primary School

Computer education has attained the status of one of the "basics" of education so often discussed today. Society demands that its children be computer literate when they emerge from the education system. Access to computer education for children in our schools has thus become a concern of modern educators.

I f we are to ensure such computer literacy, schools must assume the responsibility for including computer use in all academic areas at every level of education. If this is not the case, then the equality for which we strive in education will be the victim.

Most research into computer equity has been conducted in secondary rather than primary schools. The initial introduction of computers into school education was via the secondary school, common usage of computers in primary schools being quite recent.
Fitzgerald, Hattie and Hughes (1986) performed a meta-analysis of empirical studies of computers in schools and a survey of 1835 students from thirty-six Australian schools. Both their meta-analysis and their survey showed that in primary schools there were equal numbers of females and males who considered themselves to be regular users. The secondary situation, however, was quite different with many more male users than female users. The difference in results between the two levels of schooling suggests the question:

Is something happening in secondary school to turn girls against computing or does the change begin before then - in the senior primary years?

The study described in this article was designed, in part, to address this question. It is concerned with computing at the primary school level and it attempts to evaluate the role of gender on computer access. A broad definition of "computer access" has been employed. The term is assumed to incorporate not merely physical access to hardware or "hands on" but also access to

* knowledge about computers and their role in society
* teacher expertise
* a wide variety of software
* critical discussion of issues pertaining to information technology

A sample of 283 children from two schools in suburban Sydney completed questionnaires, which provided information regarding computer access. The ages of the children ranged from 7 to 12 years and they were from Years 2 to 6. Groups of questions were generated to assess children's

(i) computer experience

(ii) computer understanding

(iii) appreciation of computers

The information gleaned from the responses to the question naire are considered within these three categories of computer access.

However, a highly significant difference in sex-stereotyping between the boys and the girls involved in the study was identified.

Computer Experience

To gauge children's computer experience, the range of computer activities in which they had been involved was measured. Such possibilities as "making pictures", "using a data base", "writing stories" were involved.Analysis of the results obtained indicated that
the boys and the girls in the sample had equal computer experience.

Computer Understanding

Equality of understanding was assessed by investigating children's understanding of

(a) the concept of computers and their technology, and

(b) the role of the computer in today's society

While there was no gender difference in understanding the concept of computer technology, boys did have a greater understanding of the role of computer technology in today's society. Thus while primary school girls understand computer operation and terminology as well as boys, this understanding does not transfer across to an understanding of the computer's role in society. **Boys have a greater knowledge of the practical application of computer technology than girls.**

The gap or lack of transfer indicated by the results could provide us with a vital clue in explaining girls' access to computers in the secondary school relative to boys.

If girls had a greater understanding of the ways in which computers are used in everyday life, they may see a greater need for continuing their use of computers in the secondary school. Obviously more emphasis needs to be placed on developing a greater understanding of the role of computers in society among primary school girls.

Appreciation of Computers

Children's appreciation of computers was investigated by three measures

(a) interest in computing

(b) critical perception of computer technology

(c) level of unbiased attitudes towards educational opportunity (in computer activities)

There is often an assumption, particularly by software manufacturers, that boys are more interested in computing than girls. There is some evidence to indicate that this is indeed the case by the time children reach the early years of secondary schooling (Wilder, Mackie and Cooper, 1985; Fitzgerald et al., 1985). **No such evidence was produced by this study.**

Nor was there any evidence of difference based on gender in children's critical perception of computer technology. Girls and boys in the primary school were equally aware of the potential and limitations of computer technology.

If children are to possess attitudes of equality towards educational opportunity then their attitudes to computers must be free of gender bias. **However, a highly significant difference in sex-stereotyping between the boys and the girls involved in the study was identified.**

The girls considered that girls and boys were equally interested and capable in their use of computers. Boys, however, considered themselves to have greater computer interest than, and superior computer ability to, girls.

This is an interesting discrepancy which may assist in understanding why girls' interest is not maintained in secondary school. Boys and girls expressed the same level of interest and girls believe they are as capable as boys when using computers but boys perceive themselves as more interested and capable. It is important that, at the primary level, **girls firmly believe they are on an equal footing with boys in computer matters.** The conviction that they are more capable helps to explain the greater computer confidence of secondary and teriary males and there greater assertiveness in the computer classroom (see Wilder, Mackie and Cooper, 1985; Culley, 1986; Sian and Macleod, 1986; Crawford, Groundwater-Smith and Millan, 1990).

Overcoming the Inequities

The staffs of the schools involved in this study were aware of the risk of unequal computer access and measures had been introduced to ensure equal access. Children used the computers on a roster basis rather than as a reward; girls were encouraged to transport and set up computers as often as boys; girls, as well as boys were trained as computer "experts" or helpers.

In spite of these precautions the study identified two areas of inequality between boys and girls. Both of these areas need to be addressed by teachers if we are to increase computer equity in the classroom. Any such attempt would need to be two-pronged.

(i) *Computer Course Content*
The ubiqitous nature of computers must be understood by girls if they are to be convinced of the need to continue using computers through their secondary careers. If girls realise the practical applications of computes their interest may well be sustained through the highly "social" years of adolescence. A component of any primary computer course then, should be a study of everyday uses of computers in a way that would be of interest to both boys and girls.

(ii) *Development of unbiased attitudes towards educational opportunity*

The girls in this study had the more unbiased attitudes towards educational opportunity in computing activities. Therefore, perhaps girls are not the main group to be targetted by educators bent on equalising computer access. The cause of equitable computer access may be better served if we target boys. Unbiased attitudes need to be developed in boys, so that they will not overrule girls in the computer classroom.

An appeal to the sense of "fair play" could produce results, as could discussion of research which shows that girls' computer ability is at least equal to that of boys (e.g. Linn, 1985). Computer work completed by girls in the class could be shown by way of illustration of girls' capabilities. Demonstrations, either actual or videoed, of women computer scientists or women in factories controlling computers, could be of use in this context. Women computer users could be invited to inform children about their work.

Computer inequities are not so great that we cannot overcome them. By our awareness of the existence of such inequities and by our identification of their nature, we have, as educators, made the first step in equalising all childrens' access to computers.

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Why The Aboriginal Child Succeeds At The Computer

Brother R.R. O'Donoghue

(Reprinted with permission from The Aboriginal Child at School, Vol. 20 no. 3)

Recently I asked a young teacher who made much use of the computer in her classroom, "Why do Aboriginal children succeeed at the computer?".

She gave these reasons:

1. ***Racial differences go out thew window.***
2. ***Ability groups do not matter- all are happily involved.***
3. ***Concepts, eg direction, come early.***
4. ***Hastens sight-word recognition.***
5. ***Adult helpers are well employed.***

While this is the experience of only one keen, dynamic teacher, the points made indicate some of the findings I have made in my work as Resource Colleague for seven Aboriginal schools in the East Kimberley in the past four years.

The schools I attend stretch over 700 km from St Joseph's Wyndham in the north to John Pujajangka Piyirn at Lake Gregory in the south. The other schools are at Kununurra, Warmun, Billiluna, Ringer Soak and Hall's Creek. Enrollment ranges from 50 to 150 students. With the exception of Kununurra, where 25% of the students are white, all the students are Aboriginal.

HARDWARE AND SOFTWARE

Primary classes use Acorn BBC computers while the Secondary pupils have IBM compatibles. The software for the BBC's is that found in city schools- very British and western in culture. This is not to say that it is not worthwhile; the strongly realistic educational approach of the BBC software gives these programs a universal appeal that all children respond to. "Podd" is loved by all; "Albert's House" is understood and enjoyed by children who live in shanty huts and "Zoopak" brings cheers when Petra is found or the Giraffe put together again. To date, the same cannot be said for the IBM software for secondary students.

As in all schools, word processing is common. "Edword", the "Wordsmith" and "Prompt/Writer" are the most popular. Children write in English and Teaching Assistants put their hand to translating their stories into Kukatja and Walmajarri (Lake Gregory) or Kija (Warmun).

The drill and practise software which generally call on strength in language and numeracy occupies a minor role. Children who have the greatest difficuty with reading will find "Zap the Numbers" a good distraction. Boys, particularly, are quite happy to Time-zone their way through these programs over and over again. I have seen children succeeed with "number Painter" just by remembering what they did last time- there is no need to know the tables of addition and subtraction when visual memory can do it.

The most used software is the adventure/simulation type-
"Wizard's Revenge"
"Dread Dragon Droom"
"Dinosaur Discovery"
"Goldfields"
"Animal Rescue"

It is most absorbing to take a group of Aboriginal children through "Space Mission Mada", working together to make our way through the puzzles. Aboriginal children are used to co-operative enjoyment and all, weak and strong, are brought into the exercise.

GAMES VERSUS THINKING

One interesting issue is whether or not to use arcade games like "Pacman". After

Like you, we understand that education has as much to do with people, as computers.

So, meet the team.

This is Apple's Education staff. All of them computer specialists; all of them enthusiasts! Most have come to Apple from positions as full-time teachers. So if you talk about the classroom, they understand.

When you attend an education conference, you'll find them there, too. Not just telling you what Apple has to offer. More importantly, they're listening, observing, and making improvements to our technology and our publications so that we provide better education solutions for you. Better computers, better training, better support.

And when you're back at school teaching, they're learning - not just from schools and universities in Australia, they're also looking overseas to adapt good ideas and technology that will help Australians learn.

We believe that this team of people has helped make Apple the choice of most Australian schools and universities. Because, as educators, you understand that having the best computers is not enough. You need a company you can count on standing behind them. And over the years, this team has proved that Apple has a commitment to the future of education.

Dedicated to learning

IT BR06

some trials and observing the disturbing effects on learning, motivation, peace in the classroom and care of equipment, all teachers soon had to withdraw the programs. It seems to me that games soon become boys territory. They take to them more quickly and assert their physical and vocal strength to get ownership of the keyboard. Girls tend to back off under the pressure and lose interest.

On the other hand, it is my experience with Aboriginal children that the girls are able to make the most of the ordinary programs.
I put this down to:
a. Girls tend to have a greater affinity for language; their reading habits are better developed.
b. There seems to be a greater appeal for girls in the programs that call for some anylitical thinking about character and plot.

LITERACY AND NUMERACY

We must remember that English is a second language for most of the Aboriginal children. How would white children manage "granny's Garden" in German or Japenese? The children up north lack the semantic and syntactic skills that these programs assume are in every day use.

Some exercises are quite threatening. Children who have little use for pronouns, conjunctions, etc, must be sorely tried by our compound sentences, subordinate clauses, and other complexities of our language. Most of the text used by children, even in their writing, is narrative or recounting; expository text creates many problems.

Numeracy causes even greater worries. Tables have little relevence and addition and subtraction are rather meaningless to Aboriginal children. "Zap the Numbers" is very reliant on memory and boys succeed here fairly well.

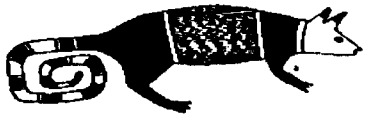
SOME REASONS FOR

SUCCESS

One thing is evident in using computers with children: computers msmerize and challenge them. I offer some ideas why:
1. Computers are friendly, they encourage rather than chide.
2. Computers offer colourful graphics and quick dynamic action. Aboriginal children have strong visual/spatial memory skills.
3. There are many programs which do not depend on reading skills; the children can exploit their learning style of "learning from watching".
4. The absence of the spoken word removes one of the greatest difficulties for the Aboriginal child- the difficulty in listening to and understanding what is being said, especially by a white teacher.

This aspect of the situation seems very obvious to me. Most of these children speak one or two of the following languages: Kukatja, Jaru, Walmajarri, Kija, Kriol. Their spoken and written English is practised almost entirely in school which, for some, could be less than 50% of the school year. What a relief it must be for these children to give their whole attention to the visual thrills without having to translate what is almost a foreing language and, after all, it is the language of the conqueror.
In the development of literacy and numeracy skills, the computer can be a great motivator. If student application and concentration are any quide, then they are making progress. But, if we watch children playing Nintendo making progress, we see the same strengths- but what sort of progress is being made? It is quite common to see even Secondary school children continue playing basic addition games for a whole year with no wish to move to subtraction etc. Leaving children at the computer to do what they like is no way to success.

THREE PRINCIPLES



I think that it is important to keep in mind the following when we want to get the most out of the use of the computer:

1. The most important element in the successful use of computers in schools is the competent, encouraging teacher.

2. The proper use of the computer will allow the student to make mistakes and learn from them.

3. The four language modes- speaking, listening, reading and writing can be practised at the computer.

SUMMARY

The main reasons that I see as contributing to Aboriginal children's success at the computer are:

1. Computers appeal to the Aboriginal strengths in visual/ spatial memory skills.

2. They release the child from what is sometin :gative influence of a v .. ..acher speaking high level English, particularly where the children have glue ears or punctured ear drums.

3. Tactile skills are exploited.

4. The computer is a most patient medium and allows many mistakes and the freedom to "try anything".

5. There are instant results and pleasure. Compare process writing per the pencil and using the keyboard.

6. Programs are full of fun; many are simulations and employ gentle, exciting and happy sequences.

This is only part of the story. We must look more closely at the nature and quality of the success we think the children have achieved.

VALE Lindsay Rockliffe

The CEG Directors were shocked recently to hear of the death of fellow director Lindsay Rockliffe. Lindsay was a tireless worker for the committee, with continuous good humour and gentle manner. He always maintained that he had much to learn still in the field of computer education, but was always willing to help others and spread the knowledge he had.

Lindsay's teaching background was in Secondary, and he was Deputy at Malvina High School.

Lindsay died suddenly of a massive heart attack on Friday xth of August. Typically, the next day he was to have joined the other committee members to help in the selection of a conference venue for the 1993 Annual Conference.

Lindsay is succeeded by his wife Pat and children Katherine, Andrew and Michael

The directors extend their sympathy and feelings to the family in this time of grief.

Lindsay will be greatly missed as both a colleague and a friend.

Miller Educational Technology Centre

Refurbished and Re-opened!

On Thursday and Friday 29th and 30th October, over 400 visitors, including local teachers, took the opportunity to visit the Miller Educational Technology Centre in South West Sydney. The occaision was an exhibition and trade fair, celebrating the completion of major upgrading and expansion of the Centre.

Special guest speakers, introduced by Janice Cherubini, Manager of Miller, included Dr Alan Laughlan, (Assistant Director General), Mr Bryan Smith (from *Beyond 2000*), Mr Geoff Walton, the Program Director. Companies involved in sponsorship and support of Miller were also invited to the celebration, as well as principals, cluster directors, and representatives of tertiary institutions.

Bryan Smith and Alan Laughlan discuss the winning entry in the Miller Logo competition with the finalists.

Facilities Now Offered by the Miller Educational Technology Centre

- a Multimedia laboratory, featuring
  - an Acorn Archimedes Network
  - Amiga machines
  - synthesisers and keyboards
  - CD ROM technology (across platforms)
- 1 Macintosh Laboratory
- 1 Protech (DOS) Laboratory
- Digicard Network across DOS, Macintosh and Apple][GS
- a TAS room, featuring
  - Pfaff computer controlled sewing machine
  - tools for wood technology
  - plotting and CAD equipment
  - control Technology, including LEGO

Miller is Metropolitan South West Region's Technology centre - a focus for technology education in the Region, and a lighthouse facility in its entrepeneurial activities geared to earning the means for quality support of the Region's schools and personnel.

Miller has operated for many years, first as a location where the computer consultants could be found, then as a computer centre, where teachers could learn how to use the new technology, and where they could gain 'hand's - on' experience for their students. Teachers have always been encouraged to bring their classes to the centre thus increasing their technology access.

Miller had never had a formal opening - and had experienced two phases of expansion prior to the one that lead to the Exhibition. The current phase has taken the centre to a facility that any Region can be proud of - as the inventory at left attests

Even before the refurbishment of Miller, courses and activities for staff and students in Met. South West were operating at a hectic pace. This has

not slowed, and Miller provides a wide rangeof activities, as summarized in the chart.

Despite being fundementally aimed at assisting teachers to develop classroom skills, the overwhelming impression one gains on entering one of the rooms at Miller, is NOT that of entering a school or classroom. Well laid out, ergonomically sound, bright, spacious work areas are to be found in what used to be ordinary classrooms. Carpetting, comfortable chairs, vertical blinds, controlled lighting, air conditioning - all the things any teacher would covet for their technology rooms are there.

Notwithstanding the above, the staff at Miller realise that the physical learning environment is only part of the necessary package. Careful planning goes into every aspect of the support structures provided. A number of consultants with different technology backgrounds work together to provide a cohesive and well defined program that is responsive to the needs of teachers, community, industry, and the Department.

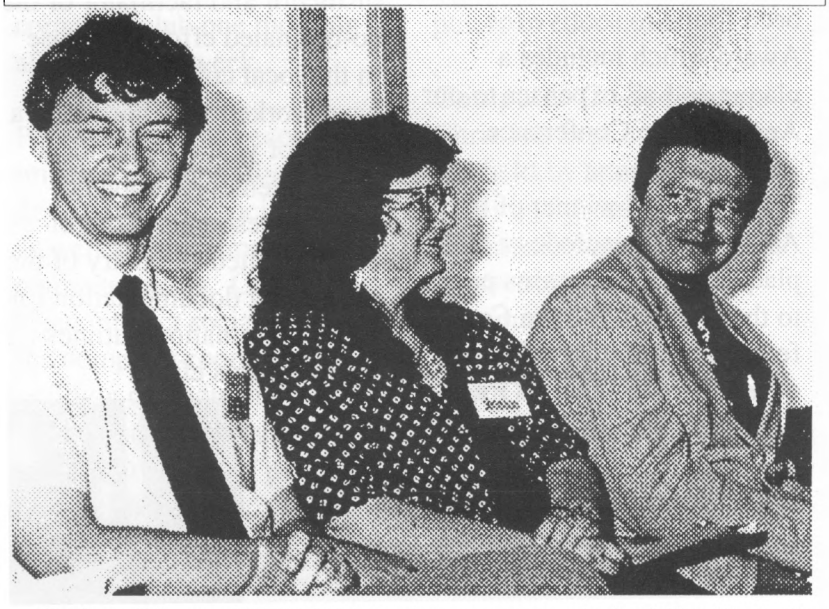
In his address to those attending the formal ceremony, on the Friday, Bryan Smith commented:

If it's green or wriggles, it's biology.
If it smells, it's chemistry.
If it doesn't work, it's physics, and if nobody understands it, it's computers.

Activities Currently Provided by the Staff at Miller

- loans of classroom sets of laptops (with laserprinter)
- inservice courses in the use of all contract hardware
- staff development programs
- individual assistance to teachers in the region, in class if needed
- school based staff development programs (over a term)
- loans of laptops with modems
- modules in Acorn, Amiga, DOS, Macintosh and LEGO technic control with one-to-one consultant support
- loans of CAD equipment
- loans of Controlled sewing technology
- linking with industry support
- multimedia production facilities
- desktop publishing facilities, including scanning and digitizing
- loans of Dicam equipment
- Science courses
- Telecommunications facilities and support
- Curriculum support courses
- support for special projects - such as National Geographic, FrEdmail, Telelearning, The Day in the Life of the Georges River. . . .

and the list goes on!



Graham Moore of LEGO Dacta shares a moment of mirth with Janice Cherubini, manager of Miller, and Bryan Smith from Beyond 2000

I don't like to disagree with such a noted personality, and while I don't know how many green wriggly smelly things there may be around Miller, the people there definitely do understand computers!

Mr Smith also said:

The Future really is what we choose to make it

and teachers in Met South West have the opportunity with Miller in their area to really make something of the future.

The staff at Miller may be contacted on:

phone: 607 7155
fax: 607 5767
Keylink: Miller

NSWCEG 1992 Computer Educator of the Year

In 1991, NSW The Computer Education Group instituted a series of Awards to recognise and reward excellence in three fields of Computer education in New South Wales schools. One of these was to recognise an educator who had made a significant contribution to promoting the use of computers as a tool for education in any level of education in our schools. Since 1992 is the first year of this Award it is fitting that such a worthy recipient has been found to receive the Award which includes a plaque and all expenses to our Annual State Conference.

The inaugural winner of the Award which includes a wall plaque and all expenses paid to the NSWCEG State Conference, is **Mr Chris Taylor** of the **Bilgola Plateau Public School.**

In the words of his nominator, David Moxon, the school Principal,

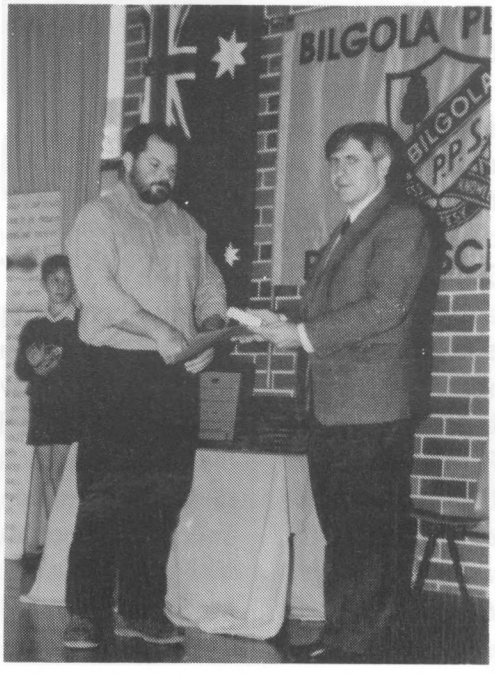
> *"Chris is indefatigable. When appointed to this school he saw what a computer quandary we were in and, following discussion with executive and myself, and more discussion with the whole staff, we formulated a policy and pursued it. He enthused us all and in particular the parent body who recognised his skill, vision and commitment and agreed to support our plans financially. We developed a computer literate community by parent/teacher training, the training of monitors, parent involvement in funding raising, working bees and classroom assistance. As a result of all his work Bilgola Plateau School is proud of the Minister for School Education's recognition of us having a Centre for Excellence in Computer Studies in 1991."*

According to his nominators, Chris has been the main instigator and facilitator of the co-ordinated efforts of those in the local community who have worked very hard over a period of years to provide a comprehensive computer learning resource. The following edited summary of the supporting documentation for Chris' nomination outlines the results of this effort.

The Bilgola Public School Project

The hardware. The project has provided an educational computer network not only in an air-conditioned computer room but to every classroom in the school. Local area printers are provided in the Computer Room, Senior Primary classroom area, Junior Primary area, and Infants area. Computers have become an integral teaching resource in all curriculum areas.

Software. A large range of software has been provided to support learning activities in many curriculum areas including mathematics, geometry, language, problem solving, music, graphics and keyboarding.



Martin Maquire presents Chris Taylor with his award on behalf of the New South Wales Computer Education Group Award Committee

Communications. An integral part of the computer network is its internal communications system. Children are able to send mail to any other child in the school via a program called Messenger. This program also has Bulletin Boards where children can send News, Sports results, run Advertisements or ask a question to a member of the school Parliament.

Lunchtimes. At lunchtime the computer room is used by students on a grade basis. Priority is given to children who have school work to complete at these times. Children use computers for leisure as well as for learning. A teacher is on duty and computer monitors assist children with their problems.

Computer Club. Primary children may join the Computer Club for an annual fee which provides money for programs which are available to club members only. Club activities aim to empower children and to build confidence in using computers. The club runs mornings and afternoons and is supervised by parents on a roster basis.

Holiday Clinics. The computer room is open to children for several days during school holidays. Parents pay a fee and the school computer coordinator assists children to extend their knowledge and understanding of computers. Children dismantle and assemble computers, learn how to trouble shoot, learn extra skills on the network as well as use a variety of programs. It is open to children in years 2-6.

Computer Monitors. Each year, children are selected by their peers to be Computer Monitors. This is a very responsible and sought after position in the school. Children are selected and trained in Year Five to become Computer Monitors in Year Six. Monitors are generally responsible for assisting teachers, parents and children with computers and are rostered on duty at least one lunchtime per week and at computer club one morning or afternoon per week.

Peer tutoring has become an important process for the development of social skills as well as educational and computer skills. Children often interact socially outside the computer room after building contacts in the computer room. This is a very important aspect of personal development.

At times monitors assist a teacher or parent having difficulty. From time to time they are requested to assist in the computer room on weekends and in holidays to assist while programming and debugging is taking place.

Teacher Involvement and Training. The school has relied upon the contribution and co-operation of the entire staff in the development of the computer system. All major developments and decisions were discussed at staff meetings. Staff development, which has been an integral aspect of the long term plan, empowers all teachers to become both confident and competent computer users building upon experiences and skills already gained. It also has to be flexible enough to train new teachers as they transfer into the school.

Staff development days and inservice days have been provided to allow teachers to develop units of work, and to develop skills in using computers in education.

Computer Co-ordinator. Chris has kept up to date in the field by attending conferences and presenting papers and sessions at these. He is Convenor of the School Computer Committee, an executive member of the AEUG and the Barrenjoey Cluster Leader for Computers. He is on the organising committee for the 1991 Metropolitan North Computer Conference.

BPPS Computer Committee. A committee of parents, school executive and teachers meets from time to time to discuss, plan and implement policies and actions required. All major developments are discussed at this committee before being presented at staff and/or parent meetings. The long term plan of this committee enabled the system to be developed in stages. Upon

achieving the goal of completing the computer room, the next stage was networking the classrooms.

Parent Involvement. Parents have always been involved in the computer development at BPPS. The P & C raised in excess of $40 000 for computer development, but parents have been actively involved in the decision making and the physical work to install and maintain the facilities.

Adult Classes. Classes are also run on a regular basis for adults who are charged a commercial fee for introductory and advanced computer courses. This raises funds to be invested in the computer network. Not only does the money assist in relieving pressure on other school funds but reinforces to parents the usefulness of computers in education.

Classes are now being run in computer education for the Manly-Warringah Evening College which also heightens community awareness about computers in education and, in addition, raises money for the school.

Professional Approach to Computer Education. The staff believe that if the computer system works well that both teachers and children will be keen to use it. After initial problems a contract programmer was employed to iron out bugs from time to time. It cost several thousand dollars but it was felt that it was better to have 15 computers working exceptionally well than have 17 causing chaos and frustration.

Industry Involvement.

In November 1990, BPPS entered into a partnership agreement with Acorn Computers to finalise the development of the computer network.

Chris Taylor explains aspects of the Acorn network to Mr. Ritchie Stevenson, Director of Barrenjoey Cluster, Principal David Moxon, and Martin Maquire

Editors Note:As a result of being named Computer Educator of the Year Chris was also invited to address Macquarie University students involved in the Computers in Schools course, giving a wealth of useful information about what happens in the 'real world' of the computer teacher. Congratulations Chris!

Do YOU know of anyone doing good work out there? Let Martin and the Awards committe know!

DID YOU KNOW that as a result of passing the bucket around at this years CEG State Conference over one thousand dollars was collected from our members for the Stewart House? Well Done CEG members!!

Teaching Communication with, between, and from our ESL/NESB students in 2Unit Computing Studies

Margaret D'Lany

The Idea Sheets, samples of which are on the following pages, are divided into 5 sections:-

1. reading, spelling, written comprehension
2. summarising in writing
3. brainstorming, discussions
4. verbal communication
5. communicating with the computer
6. using a computer or other dictionary
7. writing reports.

They may be adapted to suit the part of the course you are currently teaching. The first mentioned, 'Just keep talking, 10100 seconds" can be utilized at many stages. I used it with year 11 early in term 2, when many of the students were still feeling uncertain of much of the terminology and classification of items. They had to choose any item of computer equipment and talk about it for 10100 seconds without mentioning its name. Any other student could interject a guess at any time. If the guess was correct, the speaker stopped, otherwise they talked on. They all made an excellent effort, including the students whose English vocabulary was minimal. Many descriptions had us stumped and the students appeared to enjoy the activity.

These ideas are in themselves adaptations of other ideas to be found in the following publications:-
Curriculum Corp - **SLIC**
NSW Dept of School Education -
Organising ESL
Simple Machines
Catering for the Secondary Slow Learner through Writing Experiences
Gyles Brandrath - **Children's Games and Classic Puzzles** Chancellor Press, London, 1984, 1992
The New Cambridge English Course, Penbridge UP, 1990
Peter Howard - **Practice your English**, Longman Cheshire, Melbourne, 1982

These dictionaries are most useful for preparing or solving puzzles.
Reader's Digest Reverse Word Dictionary
Pocket Oxford
Australian Oxford
The official Scrabble Player's Dictionary (Bantam Books, NSW)
The Premier Word Puzzle Dictionary (Grandrecans, London)

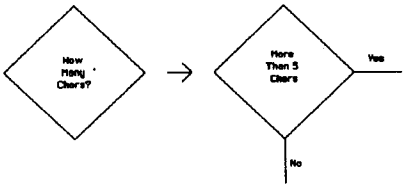
EDITOR'S NOTE: Bankstown ERC will have a complete set of the worksheets. Copying at the ERC can be done at a very reasonable rate.
Unfortunately, room, and time for typing up the material, all of which was presented in *handwritten* form, prevents the inclusion of all in this I.T.. Potential contributors are reminded that I.T. is the product of voluntary labour and neither time nor money exist for typing or retyping large submissions. Submissions should be in disc form (ANY format) and accompanied by a printed copy. Pictures, diagrams and photographs are most welcome.

#1 Just Keep Talking for10100 seconds

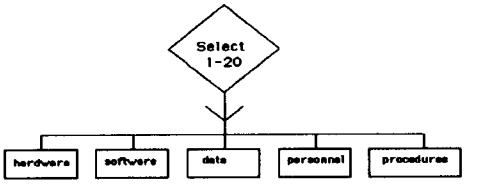
Students choose any item of computer equipment and talk about it for 10100 seconds without mentioning its name. Any other student may interject a guess at any time. If the guess is correct, the speaker must stop; otherwise they talk on.

This activity can be used as a basis, with reinforcement of programming concepts as well as verbal communication also obtained through these activites:-

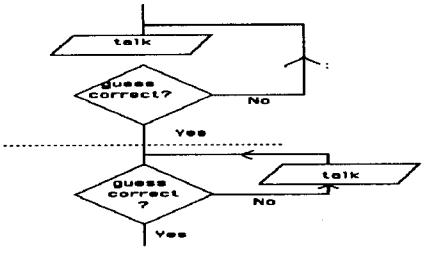
binary selection



multiple selection



iteration



#2 Hardware or Software

The old Animal/Vegetable/Mineral game with a computing twist. The game can be made more complex by adding to the categories, with peripheral, or application, for example.

#3 Word Relay

Each team receives a sheet of paper with a word on the top. The sheet passes down the team, each person adding one connected word. The fastest team wins, and selects the next word.

#4 Simultaneously

The class divides into groups of four or five. The group makes up a phrase related to the topic. The phrase is divided up so that each person takes a word. The group says their words simultaneously, and the rest of the class tries to work out what the phrase is.

#5 You are the Jury

Copyright Court: A Mini-Drama
Read or act out scenes involving different copyright issues - copying for a friend in exchange for a favour; the author of a program handing out copies to friends; the person who 'owns' the program because they paid for it; and a person making back-up copies in case of fire or theft; for example. The class is the jury. They fill out for and against case sheets at the end of the script.

Transmission Chains

One student selects a word eg, **computer**. Another picks a related word that starts with the last letter of the previous word - in this case, the word **ROM** would be acceptable. The words are written on the board to aid recognition.

#7 Cinquains

A cinquain has five lines:-
Line 1: the title, one word
Line 2: two words, describing the title
Line 3: three words, expressing action
Line 4: four words, expressing emotion
Line 5: one word, a synonym for the title.

For example:
Computers
Input, Output
Producing text, graphics
Avenue to appalling abuse
Electronics

Write a cinquain about computers, equity, power, or control

#8 Shape Poems

Write a shape poem about computers to include the terminology to be related to the topic under study.

#9 Alphabetical Acronyms

For each letter of the alphabet, find a computing acronym and describe it in its full words and meaning.

#10 Decoding

(1)

Letter	- - - - -	- - - - - -	- - -	
Parity bit	1 0 1 0 1	1 1 0 0	0 0	0 1 1
	1 1 1 1 1	1 1 1 1	1 1	1 1 1
	0 0 0 0 0	0 0 0 0	0 0	0 0 0
	0 0 1 0 1	1 0 1 1	0 0	0 1 1
	0 1 0 1 0	0 0 0 0	1 0	0 0 0
	0 1 1 0 0	0 0 0 1	1 1	0 0 1
	0 0 0 0 1	0 0 1 0	1 1	1 0 0
Missing bit	- - -	- -	- - - - - -	- - -

The parity is odd. Fill in the missing bit, then decode the puzzle.

(2)

Letter	-	- -	- - -	- - - - -	- - - - - - - - - -
Parity bit	1	1 0	1 1 1 0 1 0 0 0	1 1 0 1 1 1 1 1 0 1
	1	1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1
	0	0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0
	1	0 0	1 1 0 0 0 0 0 1	1 0 1 0 1 0 1 0 1 0
Missing bit	-	- -	- - -	- - - - -	- - - - - - - - - -
	0	0 1	0 0 0 1 1 0 1 0	0 1 0 1 1 0 1 0 1 1
	1	0 1	1 1 0 0 0 0 1 1	1 0 0 0 0 0 0 0 1 0
	0	1 0	0 1 1 1 1 1 0 1	0 1 0 1 0 1 0 1 0 1

The parity is even. Fill in the missing bit, then decode the puzzle.

Error Messages

Why do programmers delight in writing software which gives totally incomprehensible messages in the event that something goes wrong? Without naming names, here are some choice examples from a couple of high level, high class programs:

Internal error: bad hole record index detected by line walker

Given that

a) I didn't know I had a hole in anything except the middle of the disc, and

b) I don't know anybody called Line Walker (a friend of the Phantom, perhaps?), this one meant nothing to me.

Lock not expected but found

Lock? Found? So what?

But the crowning achievement would have to be:

Table still checked out

What table? I hadn't even made a booking! And if there was no table available, why was I there? Was I trapped in BistroMathics calculating mode?

Claris CAD in the Classroom- a Review

Peter Moore
Epping Boys High School

COMPUTER AIDED DRAWING (CAD) is a term used to refer to computerised two dimensional technical drawing of the type produced and used by engineers, designers, architects and draughtspersons.

Claris CAD is a fully professional 2 dimensional design and draughting software package produced by the Claris Corporation with a very comprehensive range of features including mouse / keyboard entry, construction of fillets, tangents and perpendiculars, and automatic dimensioning while fully utilising the unique "user friendly" MACINTOSH interface. It has been chosen for this report because it is currently being integrated into my Technical Drawing program for Years 7 to 10 at Epping Boys High.

The main features of Claris CAD are summarized in the box below.
These features mean that accurate and professional looking technical drawings of a wide variety can be created on computer quickly and easily.

(Further details on the features of Claris CAD can be found in the Appendix.)

System requirements

Being a fully professional package, Claris CAD is relatively expensive (about $900) and requires a MACINTOSH with at least 1 megabyte of RAM and a hard disc. The complete package takes up about 2.5 MB of space on the hard disc. Hardcopy output can be made with a Dot Matrix printer but for professional quality output a Plotter, Inkjet printer or Laser printer is required. Software included with the package supports these output devices. Using a Plotter allows for multi-colour drawings. Ideally for professional work a MAC II with 2 MB of RAM and an A4 screen is recommended.

Key Features of Claris CAD

In brief its features include

- sophisticated geometric construction tools
- editing, keyboard data entry and automatic dimensioning
- facilities for drawings to be built up in layers
- libraries and multiple views and a variety of international drawing standards
- customisable hatch patterns, line thickness, dashed lines, fill patterns and dimensioning parameters
- user configurable tool palettes and floating editing windows
- an extensive word processing facility including text style and annotation capabilities.

Suitability for the Classroom

Claris CAD is a professional use software package at the high end of CAD programs for personal computers. It is **NOT** designed for educational purposes or schools studies and as it comes, Claris CAD is not a very suitable software package for schools as it incorporates features way beyond those required by Secondary School Technical Drawing. The package comes with a disc based Tutorial and an Introductory video tape but complexity of the program makes mastery rather time consuming and requires

supervision. Working through the disc based Tutorial requires frequent consultation of the 80 page Tutorial Workbook. The User's Guide for Claris CAD is a rather daunting 450 pages. Although not designed for educational purposes its modifiable desktop means that it can be tailored for use as an introductory program and be readily expanded for subsequent extension work.

For use with students then, some form of self instructional package needs to be developed by the classroom teacher taking advantage of the modifiable form of Claris CAD.

Syllabus requirements

The Technical Drawing Syllabus for Years 7 - 10 approved by the Board of Secondary Education in 1987 for implementation in 1988 and 1989 states on P.12 that "This syllabus provides two stages for the study of computers in graphics ..... both stages require access to suitable computer resources ..... the Compulsory Stage, which provides students with knowledge of, and experience with, computers in graphics, ... requires students to plan and produce graphic images using a computer. It also requires that students have experience with the storage, retrieval and modification of graphic files". An Optional Module on computer graphics ".....aims at both developing the student's understanding of the application of computer technology to the graphics area and at providing first hand experience of some of the techniques used to produce computer generated graphics." (Further details of the objectives of the Optional module are included in the Appendix.)

In the absence of a classroom with a computer for every student integrating computer activities into a normal classroom can be disruptive unless clearly structured.

Classwork Plan

For my own use at Epping Boys High School I have developed over the past four months an individual learning module based on Claris CAD called **"An Introduction to CAD"**. This learning module has been designed to introduce Years 8, 9 and 10 Technical Drawing students who may have had no prior experience with computers to CAD. It consists of three short self instructional lessons and uses a "Stationery document" created in Claris CAD with reduced menus and tool palettes to simplify its appearance.

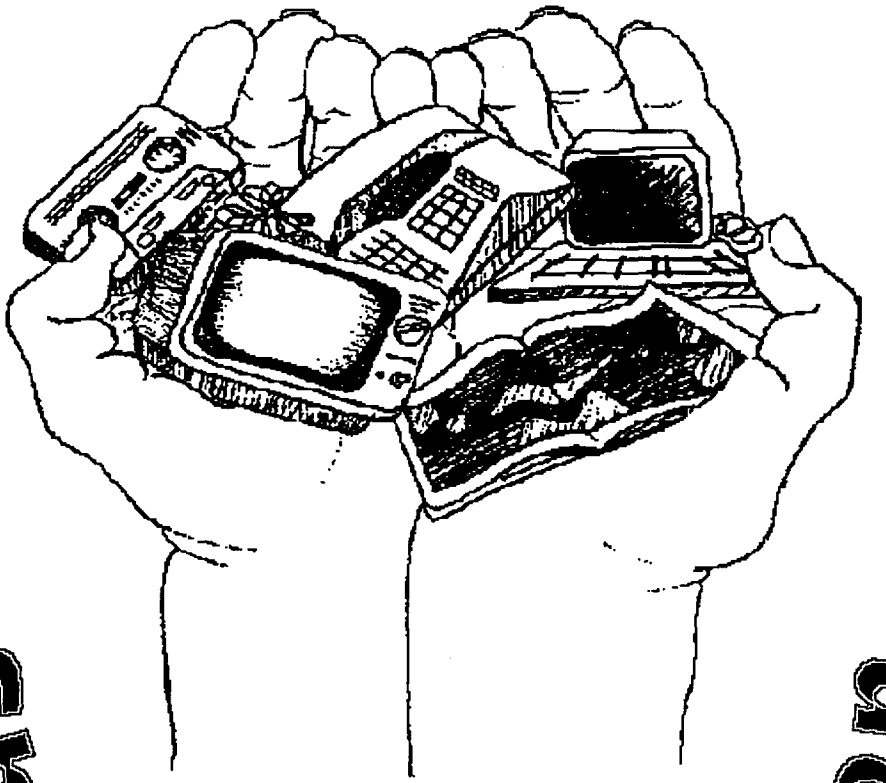
On opening the Stationary document the Claris CAD desktop shows an A4 drawing page which has been reduced in size to just fit the Macintosh screen. A copy of the screen presented to students is attached. Creating a Stationery document means that the various preset options can be modified to suit the purpose of the drawing - such as size of drawing page, ruler measurements, appearance of tools palette and location bars etc. In this way the appearance of Claris CAD can be tailored and simplified to be readily

The three **"Introduction to CAD"** lessons cover:

1. Turning on the computer and hard disc
   Finding and opening appropriate software and files
   Recognising an "on screen" drawing page
   Using the CAD program to draw rectangles, which can be adjusted in size and position to form borders or title blocks, and other geometric patterns typing, resizing, restyling and repositioning text in a CAD program. Printing a hard copy of the "on-screen" work
   Closing or putting away work created "on screen"
   Closing down the computer.

2.. Revising the skills acquired in Lesson 1, producing a personalised drawing page and saving it to an electronic storage folder for later use.

3. Finding and opening personal files and drawings that have been saved at a previous session. Drawing a simple two dimensional outline of a toy boat or car.



ACEC'93

Sharing the vision

Australian Computers in Education Conference

Panthers Convention Centre, Penrith, New South Wales

28th June to 1st July 1993

Australian Computers in Education Conference 1993

Venue and Date

In June of 1993 the Australian Council for Computers in Education will be hosting the 11th Annual Australian Computers in Education Conference. The Conference will be held at the Panthers Convention Centre at Penrith in the west of Sydney, Australia. The main conference will run from the 28th of June to the 1st of July 1993. Pre and Post conference activities will also be organised.

The conference will be a forum for educators to "share their vision" of what technology has to offer in education. The organising committee wants to hear from you. Please photocopy or tear off the back of this brochure and mail it back today. This will allow us to keep you informed as more and more details of the conference agenda are confirmed.

Further Information

Please pass this brochure on when you have finished with it. The venue is large enough to accommodate a wide choice of papers and workshops. It is varied enough for many different types of activities to be held during the conference. Even if you have never run a workshop or taken part in an exhibition please consider this chance to do so.

We believe that this national conference will work on a number of levels. It will offer participants practical experiences suitable for both novices and for experienced users of educational technology. Research papers will be presented along side descriptions of classroom practice. Collectively the conference presentations will provide a view of "good educational practice" from which can come a vision of how to improve what we are doing. National conferences are opportunities for people with a common interest to look towards the future, to embed their vision of what is possible into the shared wisdom that informs what we do.

The Conference will be supported by sponsorship from industry and will include an exhibition. This exhibition will feature products and services from many companies. It is our intention to distribute an A2 colour poster at the beginning of the 1993 school year. The poster will advertise the conference and its sponsors. The New South Wales Computer Education Group may be contacted during office hours on (02) 805 9456 or faxed at (02) 805 9453.

Education is a life long process. ACEC '93 will be a valuable experience for a broad spectrum of teachers. Classroom teachers from pre school to tertiary, researchers, school and regional decision makers, policy analysts and system planners would all benefit from participation.

Announcement and Call for Participation

What kind of conference will ACEC '93 be?

Over the past years the NSW Computer Education Group has evolved a style of conference that focuses on the use of educational technology in students' learning. At ACEC '93 this style will be adapted to meet the needs of a wider audience. Conference papers reporting research and scholarship will be presentedat the same time as workshops demonstrating successful teaching practice. The conference will provide horizontal strands at different experience levels and vertical strands in such areas as Cross Curriculum Computing, Teacher Education, Special Education, Language Education, Science and Technology, Design and Technology, Computer Studies and Early Childhood Education.

* The conference will be created by those who contribute to it. The conference committee will shape of the conference from the papers, workshops and activities offered by the educational computing community. Teachers at all levels will be able to use the occasion to share what they have learnt. The exhibition will be created by those organisations who take up the sponsorship opportunities. (Contact Pete Dailhou 02 805 9456 or Ted Sawyer 02 873 1340)

* The proceedings will be distributed at the conference. An issue of the national journal orientated towards research and scholarship will be printed. Please fill in the form on the back of this page and send it in. The deadline for final submission of papers is 1st March 1993. (Contact Phil Nanlohy 02 772 9207 or Greg Butler (048) 71 3452)

* The conference will be residential. The venue has a 4 star hotel on site and family cabin accommodation is available within a short distance. Residential conferences provide for an enormous amount of informal learning and networking between participants. Non residential registration will also be possible for those who live locally. (Contact Leonie Fraser 02 610 5125 or Ted Sawyer 02 873 1340)

* While the conference is shaped by the papers and workshops a wide range of other activities will be organised for the conference. Keynote speakers, a large exhibition, hands-on workshops, after dinner speakers, plenary panels, Galah sessions, a Kids Classroom, informal forums with key educators, social occasions and much more. We expect the conference will be hard work and a lot of fun.

Sponsoring Organisations

Registration of Interest

Tape behind fold B

You are invited to register your interest in the Conference and return this section to the address below. This will assist us in the planning and enable us to keep you informed of developments. Please tick all of the ways you would wish to be involved when you return the form.

Title (Prof, Dr, Ms, Mrs, Miss, Mr) ..... First Name .....

Surname .....

Address .....

..... Postcode .....

Work Phone ..... Home Phone ..... Fax .....

Area of interest .....

.....

I wish to attend the conference, please send details of registration and accommodation options. ❑

I would also like to ..... Present my research ❑ Conduct a workshop ❑ Join the Exhibition ❑

Conduct a Pre or Post conference workshop ❑ Act as a referee ❑ Publicise the conference ❑

Fold A

Surface Mail

Please Place Stamp Here

Australian Computer Education Conference '93,
NSW Computer Education Group
C/- School of Education
Instructional Technology Centre
Macquarie University
New South Wales,
Australia. 2109

Fold B

Keeping in Touch

Please do not hesitate to get in touch with any of the people listed. They may be contacted by phone, fax or mail to the CEG office.

Responsibility	Contact	Phone	Fax
Conference Chairperson	Pete Dailhou	(02) 805 9456	(02) 805 9453
Conference Program and Proceedings	Phil Nanlohy	(02) 772 9207	(02) 774 3649
Pre and Post Conference Workshops	Greg Butler	(048) 71 3452	(02) 805 1108
Venue, Exhibition and Sponsorship	Ted Sawyer	(02) 805 9456	(02) 873 1340
Treasurer and Registrations	Leonie Fraser	(02) 610 5125	(02) 805 9453
NSWCEG Office	Neville Fraser	(02) 805 9456	(02) 805 9453

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Cut Here

Cut Here

useable, with appropriate instruction, by Junior school drawing students who have had no previous experience. The "Introduction to CAD" desktop with abbreviated palettes and a drawing page reduced to fit the screen

The **"Introduction to CAD"** learning module consists of three clearly structured lessons to be worked through by each student individually and independantly. Each lesson can be completed in approx. 35 minutes. Normal classroom lessons can proceed with the remainder of the class. It is anticipated that it would take approximately six months to rotate the class through all three lessons.

The unit includes instructions on turning the computer on and off and opening and closing appropriate files.

Evaluation

So far all of one Year 8 Technical Drawing class (23 students) has completed both Lessons 1 and 2 of the "Introduction to CAD" learning module and during that time the instructions have been rewritten several times to ensure that the lesson can be completed with a minimum of teacher supervision. In its present form most students can complete the lessons without help. A problem is occasionally encountered when an object is created which extends beyond the bottom or right hand edge of the A4 page visible on the screen. When this happens Claris CAD creates new pages joining to the original page to provide space for the object. This can create difficulties for students in keeping the original page on the screen and problems in printing. Unfortunately there is no facility in Claris CAD for locking the preset drawing size to a single page.

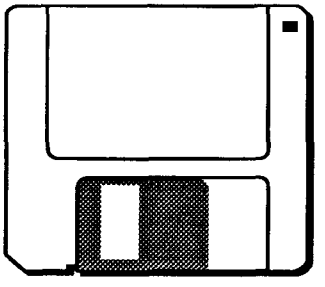
At the completion of Lesson 2, a printable class list is available on screen for record purposes, an example of which is in the Appendix. Currently the class is working through Lesson 3. Some examples of their work have also been included in the Appendix

The **"Introduction to CAD"** learning module is proving to be very popular with the students. Being self instructional, normal lessons can proceed in the classroom. A mobile table has been built which holds both computer and printer which allows easy movement of equipment from room to room. Teachers of other classes, some with no prior computer experience, are also beginning to use it.

Plans are being made at present for further self instructional packages to introduce other features of CAD. Further developments though are limited by the shortage of hardware and by the increasingly high demand for the one MACINTOSH. Purchase of additional equipment is planned with anticipated costs being MACINTOSH $2,000, hard disc $1,000, printer $800, Claris CAD $900, giving a total of about $5,000.

Conclusion

The user friendly MACINTOSH interface means that students with no prior computer experience can quickly master the basic operations of the machine and the modifiable form and provision for saving tailored documents as Stationery make Claris CAD an ideal software package for use in Technical Drawing. The fully professional nature of Claris CAD allows plenty of scope for extension work for advanced and Senior students. The "Introduction to CAD" learning module allows individual students to work independantly at a computer while normal classroom activities and lessons can proceed. The enthusiasm which students at Epping Boys High School approach CAD indicates that the program and equipment is well suited to their needs.



Identifying, Observing and Developing High Order Intellectual Skills in High School Students - Part I

"Backtracking" as a Problem Solving Strategy (PSS)

By Ian W. Parker
Ulladulla High School,

Introduction

This paper is an account of one experience with a small group (7 boys: 4 girls) of Year 10 students. They were, as a group, given a task to perform under very strict guidelines and the subsequent analysis of their problem solving strategies.

In recent times there has been an emergent interest in developing ways of identifying, observing and developing higher orders of intellectual problem I could remember which it was..." and making contingency decisions about possible future outcomes- "If it's not <at place 1> then it must be <at place 2> which I think is where I was just befor I met you". On the other hand backing up is a simple strategy of reversing to a trigger point - and more than likely proceed down the same path. For example a trigger point in reading is the beginning of a sentence or a paragraph. Backtracking is a super-process encompassing backing-up.

Curiously though, many people, in their everyday lives, rarely employ backtracking, mainly because it appears to be superficially irrelevant on a number of counts and we seem to be able to do without it for most of the time. When employed it appears to;

- have no immediate benefit
- lead directly away from the desired outcome
- in many cases, not have any *a priori* recognisable or identifiable end points.

This research was based upon a simplified model of the problem space described by Fikes and Nilsson in their conference paper about the programing language STRIPS[2].

Fikes and Nilsson were concerned with computer based problem solving. My research was based on the idea that we ought to be able to apply computer based technology to the identification of human problem solving strategies. In a way this represents a "closing of the loop" since the problems were generated for the students as a group to role play "being a robot" not merely to articulate their problem solving strategies for themselves but for me to teach them some problem solving strategies through the sequential use of the limited state transition commands.

Through the use of systematic tactical processes which were well defined I was able to monitor, describe and subsequently analyse their problem solving tactics and strategies. Later I applied Artificial Intelligence techniques to detect and analyse "backtracking" in their problem solving process.

The Task

The students were given three A3 sized sheets of paper placed on the floor.

- Sheet 1 contained a pictorial description of the Initial Situation (See Figure 1)
- Sheet 2 contained a pictorial description of the Final Situation (See Figure 2)
- Sheet 3 contained a list of the the Rules by which they could try to achieve the transition from the initial situation to the final situation. (See Figure 3)

To assist with their task a small toy robot, a small wooden cube, and a small

*Robot, 4 Rooms, Block, Pyramid microworld

wooden pyramid were available to be used as "markers". They were **not** able to use any other kinds of *aides-mémoires* such as a pencil and paper. This arrangement we will call the R4RBP* microworld.

The session took one 52 minute period and was composed of 3 phases

- the Briefing - about 5 minutes
- the Problem Solving Activity - about 30 minutes
- the Debriefing - about 15 minutes

My primary aim was to try to observe the group's Problem Solving Process (PSP), to see if they employed the Backtracking Problem Solving Strategy (PSS) and to subsequently through debriefing develop this skill for them. The task was of sufficient complexity - given that two rules governing how the Robot could deal with carrying the Pyramid and Box in the problem were not explicitly stated - for it to become necessary to employ Backtracking to successfully complete the task.

Phase 1 of the session was taken up with students becoming aware of the notation used, and the meaning of the special syntactical forms of the commands and queries. This approach uses a "finite state grammar" approach to problem description and interaction discussed in a paper by Ramani[3] The finite state grammar used is described in Figure 3. If you like this was setting the ground rules by which they could solve the problem.

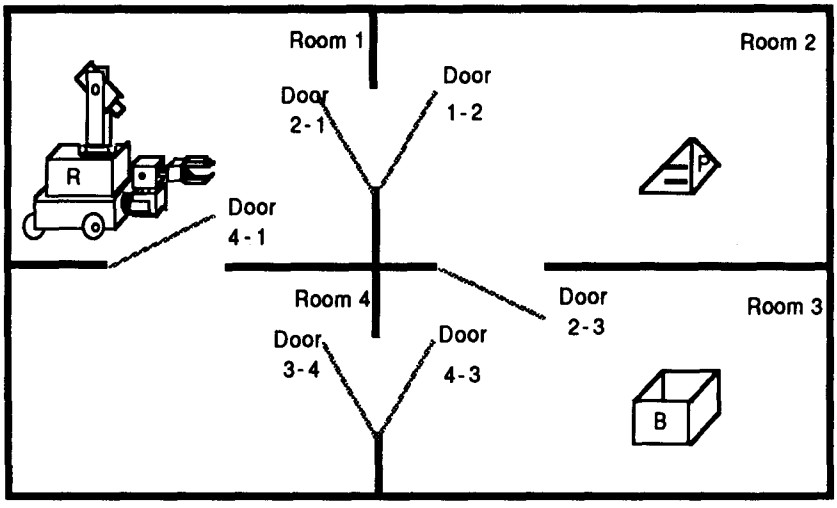


Figure 1 - Reduced copy of Sheet 1 -Initial State

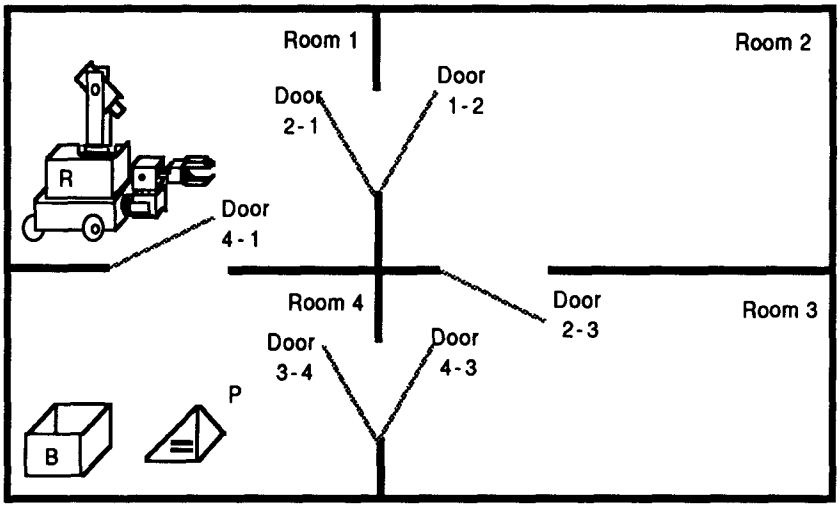


Figure 2 - Reduced Copy of Sheet 2- Goal State

Instructions/ Questions you may use at any step to solve the problem	
X *exists*	X *open*
Robot *able-to-hold* X **Robot** *grasps* X X *put-on* Y **Robot** *un-grasps* X	**Robot** *opens* X **Robot** *goes-through* X **Robot** *close* X
X *held-by* **Robot**	X *on* Y X *in* Y

Figure 3 - Query And Action List (QAAL) for Robot, Box, Pyramid Problems

In the following discussion: **Q** means question asked by the students. **A** means Answer given by me. **E**

means further explanation for the purposes of this discussion, remembering that the basis of my interaction with them was to be through the use of a micro-Prolog Program which represented the strict interaction protocol constructed using just these identities.

A sample of the Briefing Session dialogue is given below...

Q What is meant by (Door 3 4)?

AThe first numeral is the room that you (acting as the robot) are leaving, whilst the second is the numeral of the room that you are entering.

EA two way door was coded as simply

(Door X Y) exists
(Door Y X) exists

whilst a one way door was coded as

(Door X1 Y1) exists

Q Can the robot hold the box at the same time as the pyramid?

AYes! We may deal with the case of where the robot can only hold one thing at a time later.

EThis was the only discussion about this issue during the Briefing! Just how the Robot handled the picking up, transport and putting down of these items appeared to be "clear" to the members of the group.

In the micro-Prolog Program this was simply coded as

(Pyramid held-by Robot)
(Box held-by Robot)

Indeed it would be more complex to only allow one object to be held at a time. To do this you would need to identify that the relation list **held-by** was undefined before attempting to add to this relation list.

Q What commands are available for us to use?

AThese (refering to Sheet 3). You should realise that X and Y can stand for any one of the following: The Robot, the Box, the Pyramid, the Floor or any one of the Doors **if it is appropriate**. For example:

Robot *opens* (Door 1 2)
is acceptable
Robot *is-in* (Room 2)
is acceptable
Robot *on* **Box**
is not acceptable
Robot *able-to-hold* **Robot**
is not acceptable

.... (further explanatory discussion along these lines)

EThe third sheet with the commands available was discussed. It was pointed out that these were the only commands or if used in this way, questions, that were able to be used and that they would have to present them to me for an answer which they would have to accept. If further questions were needed to be asked then they could only be composed from the list given.

I would then answer only:

YES meaning that it was TRUE either that the action could be done and was done or that the situation did exist

1. Object List in micro-world

Robot	Pyramid	Box	Floor
(Door 1 2) (Door 4 3)	(Door 2 1) (Door 4 1)	(Door 3 4)	(Door 2 3)

2. Initial Situation

Robot *exists*	Floor *exists*	Pyramid *exists*	Box *exists*
(Room 1) *exists*	(Room 2) *exists*	(Room 3) *exists*	(Room 4) *exists*
(Door 1 2) *exists*	(Door 2 1) *exists*	(Door 2 3) *exists*	(Door 3 4) *exists*
(Door 4 3) *exists*	(Door 41) *exists*		

Robot *in* (Room 1)
Pyramid *in* (Room3)
Box *in* (Room 2)

Robot *able-to-hold* Pyramid
Robot *able-to-hold* Box

Pyramid *on* Floor
Box *on* Floor

Figure 4 - Microworld object list and Initial Conditions of Problem

NO meaning that the action could not be done or that the situation did not exist.

I did not at any time engage in a discussion as to the reason for the answers given. This was the responsibility of the students to "discover".

It is interesting to note that as an aside (but a very important observation) that the relation

X *on* Y

was not initially provided as a possible relation to be used. It quickly became apparent to me that this had to be Generated and Integrated into the list of Rules in order for the students to be able to determine the complete status of either the Pyramid or the Box. This was done just before we started.

Figure 4 shows the information only available to me. The students were not shown this information but were expected to develop a way of maintaining this information once obtained from me.

A comparison of some predicates with those used by Fikes and Nilsson and in this study

Fikes & Nilsson (STRIPS)	Parker(micro-Prolog)
go-thru-door(d,l,m)	**Robot** goes-through (Door l m)
locinroom	**X** is-in (Room Y)
connects(door,room1,room2)	(Door room1 room2) exists
onfloor	
type(item,generic type)	
at(item)	
at(robot)	Robot able-to-hold X
status(object,state)	{ all predicates !}
goto1(location)	

The student protocol - Session Sequence

- **bold** entries are instances of back-tracking
- ***bold italic*** entries are instances of a lapse in the recognition of the "current situation"

	Student Operation	Referee's Response		
1.	(Door 1 2) exist	YES		
2.	(Door 1 2) open	NO		
3.	Robot opens (Door 1 2)	YES		
4.	(Room 2) exist	YES		
5.	Robot goes-through (Door 1 2)	YES		
6.	Robot is-in Room 2	YES		
	5a. Robot close (Door 1 2)		***YES***	
7.	Pyramid in Room 2	YES		
	7a Does Pyramid exist		**YES**	
8.	Robot able-to-hold Pyramid	YES		
9.	Robot grasps Pyramid	YES		
10.	Pyramid held-by Robot	YES		
11.	(Door 2 3) exist	YES		
12.	(Door 2 3) open	NO		
13.	(Room 3) exists	YES		
14a.	Robot goes-through (Door 2 3)	YES		
	14b. Robot close (Door 2 3)			***YES***
15.	box exists	YES		
16.	Is Box is-in (Room 3)	YES		
	16b. Is Pyramid in (Room 3)		**YES**	
*17	Robot grasps Box	NO		
18.	Robot able-to-hold Box	NO		
19.	Robot grasps Pyramid	NO		

Figure 5 - The Student Problem Solving Protocol - Part I

The PSP began to become unstuck at step 17. Step 17 is not possible because the Robot already holds the Pyramid. Similarly for step 18. This is a short backtrack in the process. Step 19 is not possible because the Robot already holds the Pyramid.

At Step 19 I intervened because the students refused to continue since they had lost confidence in what they were doing so I stepped outside of the actual role of "referee" to prevent the total collapse of the PSP.

My response to this development was that they should try a different approach from their natural plan of action which was to feel hoplessly lost and begin again. As they put it so that they could feel better able to cope with the situation because they could then say "Been there- done that". This was designed to enabled them to temporarily cast a safety net over their thoughts. .

Instead, I proposed that they should not abandon their current position but attempt to fully analyse the current situation as it exists for the Referee and reconcile it with their own perception of the current situation.

Having done this they should then attempt to restart the process "treating the current situation as the new starting point". Perhaps if I had been a little more patient they would have eventually tried to probe the current position but we continue with what actually happened.

From this position they again began to confidently apply their PSP.

; Check current situation			
17	**Pyramid held-by Robot**	**YES**	
	; Take a cautious approach to correcting action sequence		
17a.	**Robot ungrasps Pyramid**	**YES**	
17b.	**Pyramid put-on Floor**		**YES**
17c.	**Robot grasps Pyramid**	**YES**	
17d.	**Pyramid put-on Box**		**YES**
18	**Robot ungrasps Pyramid**	**YES**	
19	**Robot grasps Box**	**YES**	
; Check that we can leave with both Objects			
20a	**Robot holds Pyramid**		**YES**
20b	**Robot holds Box**		**YES**
20c	(Door 3 4) exists		YES
21.	(Room 4) exists		YES
22.	(Door 3 4) open		NO
23.	Robot opens (Door 3 4)	YES	
24.	Robot goes-through (Door 3 4)	YES	
	24b. Robot close (Door 3 4)	***YES***	
25.	Robot un-grasps Box		YES
	25a. Robot holds Pyramid	**NO**	
26.	(Door 4 1) exists		YES
27.	(Door 4 1) open		NO
28.	Robot opens (Door 4 1)	YES	
28a.	(Door 4 1) open		YES
29.	Robot goes-through (Door 4 1)	YES	
	29b. Robot close (Door 4 1)	***YES***	
30.	Robot is-in (Room 1)		YES

DONE!

Figure 6 - The Students Problem Solving Protocol- Part II

The Debriefing Session

At the end of the session (during which I logged the protocol of commands/ queries used by the students) we reviewed the whole process.

We considered:

- What Planning had taken place - and what constitutes a good plan
- What difficulties had arisen - and the proposed solutions
- What, given their experience, was a good description of the Backtracking PSS
- In what circumstances would this strategy be likely to be used

What kind of planning had taken place

No plan, in the conventional sense of a **proposed** course of action, was considered. The only plan was one of "suck it and see" which is more of a primitive strategy than a plan. Nevertheless it did work but not very effectively at times. Any "on the fly" planning involved only trying to record a back trace no longer than 1 step or a forward hypothesis no longer than 1 step. This was expected since they were either unaware of trace stepping" as a problem solving tactic or it did not appear to be relevent to them. There was evidence of some planning in that the aim was always to make a move closer to a goal which had been fixed upon (ie. the state configuration shown in Sheet 2), almost to the exclusion of details which may impede or prevent this. This is strongly suggestive of the use of **Means-Ends Problem Solving Stategy.** The theory of Means-Ends Analysis is well understood. When an **impasse** did arise, attention was focused on the current state, and then on paths leading out of the current state. Again this was to be expected. There was little if any consideration given to finding an optimal or "best" move consistent with an overall strategy.

The tactics most often used were to concentrate on localised problem solving with the overriding criterion of "closer to the final goal". These are intuitively quite reasonable tactics until you are confronted by a situation requiring the use of a strategy like backtracking of an order greater than 1 step.

"Querying the Referee"

Students were not told the actual "processes" of establishing whether any of the commands or queries were valid or invalid at any point in the process- only I as the referee knew the meaning of (results of "actioning") these commands or queries at the time of the session.

In general this lack of global and local knowledge appears to be the reason for activating backtracking but it does not guarantee that its use will lead to a more successful path to solve the problem. In addition to this, unless the user of this PSS is aware that it can and might need to be employed before commencing the process of solving the problem, it tends to induce confusion at the time it begins to be employed part of the way through the overall PSP. Therefore one must become aware of the support mechanisms needed to be emplaced before this strategy is employed. I have seen students "begin again" or repeat a sequence of redundant steps several times for lack recognition of the need for developing support mechanisms before employing the backtracking PSS.

In order to demonstrate this need and how it is mechanised I later showed them the micro-Prolog program from which I was working- and later still we tried the same process using a program running as a **micro-Prolog** program on a BBC Microcomputer.

The main difference between their effort and the computer's effort was that the micro-Prolog program worked systematically and had the ability to automatically perform trace stepping, local construction of the global state space and localised pattern matching over several past states. The students were intrigued by this seemingly "intelligent behaviour" of the computer. At times they asked **why** it was

performing certain actions. In common language we use the term "WHY" to mean " state the **reason** for an action (not) being (able to be) carried out". We discussed these sequences of actions to try to understand the problem solving strategy being used.

It became clear to these students that in order to support this kind of PSS three sub-strategies were to be employed:

- local trace stepping of the current situation to the next chosen situation
- incremental constructon of the global state space
- global pattern matching of past situations (to recognise and exit from repetative loops)

Taking these in turn we can see that together they represent a very powerful tool for solving problems where there is an initial condition and there appears to be many possible alternative paths.

1.Trace Stepping

This simply means that you record "changes" in the current state when you move from the current state to the next state. In this way you should have a **complete description** of the current state at all times. With the micro-Prolog program this is achieved by ADDing and DELET(E)ing clauses that is sentences or rules and facts needed to describe the change of state with respect to the immediate past state. This is a LOCAL process and is able to be used to construct the current global state space description as well as the past history trace.

2.Local Construction of the Gobal State Space

The purpose here is to construct a graph of new states and the "connections" between the new and old states. In this process non-redundant information is ADDed to the description graph but never DELETEd from this graph. To assist with developing optimisation strategies this graph would be consulted to choose novel paths noted but not explored. In common language you are "drawing a description of the area". There are three mechanisms to be employed here.

At each state (node on the graph) you would construct a list of:

- possible entrances
- possible exists
- current entrance and chosen exit

This is a LOCAL PROCESS because it only deals with information about the current situation.

3.Localised Pattern Matching over several past States

This simply means that you maintain a trace list (of any desired length) of the "past history" of the states that you have visited. At each entry into a state the "past history" is consulted and an attempt to match a previous sequence. For example the last 10 states may be recorded in sequence and you attempt to match over a maximum length sequence of 4 states. If you have a match you will need to then make a decision on "backtracking". Usually this means "unwind" the state trace to the initial state in the matched sequence.

It should also be a state from which there is a multiple exit (choice of next state). If not then there is no satisfactory solution to the problem. This is a GLOBAL PROCESS because it deals with information about many states.

Relationship to Adventure Games

Often only trace stepping is undertaken, for a number of reasons. The most important being that to hold a history trace, a global state graph, and to update and consult them can be a time and memory consuming process. For many processes which are relatively simply connected there is no need to develop a global plan.

On the other hand as Adventure game players well know, global planning is an essential task in order to manage the exploration of the Game Graph. The main difference between this model example and true adventure gaming is that the students are given a graphical description of the Global State Space before they set out. The current task is also somewhat

simpler to assist with completion of the task within a reasonable time span.

Intervention to restart the Problem Solving Process

The main difference between their attitude after intervention compared to their previous attitude was that the frequency of backtracking was relatively low, and a more coherent PSS was being applied.

Having gone though this process many students, especially those who had constructed higher level sequences of processes found that they could solve variations (including more difficult ones) of the same problem in a very much shorter time.

Conclusion

I believe that these difficulties are functionally endemic to people normally trying to solve problems of this nature - there is a natural desire to "begin again" and continually do so when the next impasse is confronted. If this continues to occur at or before the same point of initial impasse then a lack of confidence can then lead to "learned helplessness". Failure to proceed is seen as a failure to solve, rather than a failure to recognise the relationship of current position with respect to what has been achieved and needs to be achieved.

For these students in this instance the oracle provided the means to focus on, and evaluate the current impasse and the impetus to use a straight forward methodology to continue rather than abandon the current situation and begin again. A process which can only be seen as tending to reinforce the strength of the impasse.

In mechanistic terms this represents positive reinforcement of a state which can only be exited from by means of injecting into the process a significant disturbance - an **oracle** (or outside agency). There are times when one **must** call an outside agent in order to proceed. In Part II we will consider a means of analysing the behaviour of the Problem Solving Process and the Identification of instances of Backtracking.

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WHERE ARE THEY NOW?

Remember the microbee? A good Aussie made computer and one of the first into schools. It had quite a coterie of Australian programmers, and some of their software was VERY good- Simply Write and Disasters, for example, or the whole C.A.R.E. project.

Where are they now? Are they writing good Australian software on other platforms?

Where are :**Active Learning Systems, Applied Technology, Bendata, CARE, Competron, Daphne Heym, Everyday Learning, Exitek, Flying Fox, Gary Clarke, Geoff Ford, Goodison, Gracol, IWD Microdata Systems, J&H Beesware, Jay Software, Peter McCallum, MMD, Mytek, Nectar, Glyphic, Primug, Smug, Systems Research, Wattle.**

And while we are at it, what ever happened to the development team that gave us the Starnet, the 'bee, and the various neat peripherals- scanners, modems, data loggers, and so on?

If you know, write to the Editor and let us know....

Christmas is here again, and those of us who celebrate are once more faced with the perennial problem of what to give as gifts. With this in mind I make the following suggestions, just to get your thoughts working in the right direction:

For The Bloke From The Maths Faculty Who Did COMP 100 And HAS Seen It All.....a binary abacus.

For The Person Who Always Takes The Cover Off And Changes All The Settings..... A Microbee in a block of plastic

For the Boss .....the collected advertizing efforts of all the competing companies (if the boss already has this, how about the collected CEU documents, still in their plastic wrappers, just for the back shelf)

For The Parent Rep Who KNOWS What Computers The Kids Need To Have To Get A Job.....all your back issues of "What's New In Computing"

For the TAS Co-ordinator (IA)..... a CPU, monitor, keyboard, printer, disc drive, leads, etc, WITHOUT pictures showing how they go together.

For the TAS Co-ordinator (Home Ec)..... a CPU, monitor, keyboard, printer, disc drive, lead, etc, WITHOUT the recipe book.

For The Snotty Year Nine Who Always Knew About What You Were Going To Teach About..... A subscription to a technology magazine- in Japanese

For The Life Skills Co-ordinator Who Won't Touch Computers Because They Aren't Relevant.....two DOS boxes on a barbell.

For The Dealer (Who Was Always There When Needed)..... a) An English Language dictionary b) A Book of Etiquette.

For The Kid Who Never Understood ANYTHING But Kept On Trying Anyway..... a packet of Minties and a long-suffering smile.

For The Kid Who Thinks "Larry The Lounge Lizard" is "User Defined Graphics".....The C-64 tape based "Home Office"

For The One Who Likes Adventure Games.....Windows 3.1

For The Best Problem Solver You Know.....a network (and printer)

For The Resident Pirate.....Site licences for all their software- invoices to follow.

For the LOTE Teacher.....all your manuals.

For The Teacher Who Doesn't Know Much About Computers But Thinks This LOGO stuff is good.....Hugs and Kisses.

For The Parents Who Don't Know Which Computer To Buy For Their Children.....tranquillizers and heartfelt sympathy.

For The Cluster Director Who States That The Responibility For Implementing Directives Should Devolve To The School Computer Co-ordinator.....your resignation.

For The Computer Co-ordinator..... Scotch, tranquillizers, Zen lessons, island holidays and bouquets .... combined with a good long rest.

Merry Christmas

Microsoft Publisher- A Review

Neil Cant *puts MS Publisher through some educational hoops*

PREAMBLE

Microsoft Publisher may not be regarded by many as educational software in the strictest sense. It is not a C.A.L. (Computer Aided Learning) program, a C.M.L. (Computer Managed Learning) or a C.A.I. (Computer Assisted Instruction) package. Rather it is an excellent program which can fulfil a very important role in secondary schools. It is a commercial D.T.P. (Desktop Publishing) package designed for businesses both large and small, clubs and societies, homes and schools; in fact, anywhere there is a need to quickly produce quality publications with a minimum of effort and expertise. Its great strength in the educational field is its ability to support many models of teaching.

MICROSOFT PUBLISHER

The software comes in a bright, attractive box containing three 3.5" (1.44Mb) and three 5.25" (1.2Mb) diskettes an instruction manual, owner registration, software licence and warranty information. It is suited to 286 or better IBM compatible machines and will run in 1Mb of RAM but 2Mb is recommended.

Publisher is priced at $299, but is available for education use for $149 and as a Labpack licenced for 10 (educational) machines for $599 in line with Microsoft's enlightened policy on educational pricing.

The excellent User's Guide takes the novice and experienced user through the installation using the program "Setup" on the first disk. Advice is given on what sections to install and the procedure is almost automatic, by responding to prompts it takes about ten minutes and 3.7Mb of hard disk space.

Microsoft Publisher's User's Guide is an example to all software producers of what a manual should be. Its 298 pages of clearly presented guidance is suitable for first time and experienced users alike. Following the installation instructions the Guide introduces the menus and commands of Publisher then the next 16 pages are the best introduction to Desk Top Publishing I have seen. It will be essential reading for my classes.

USING THE PROGRAM

Microsoft Publisher is similar to most DTP programs in that it is based on frames and guides similar in concept to "cutting and pasting" in the pre-DTP days but adds the capability to make the frames transparent or opaque. As such it is fairly natural in use, but it allows for objects once created to be moved and resized as needed, and to have text added later on. It also supports the use of templates and "Page Wizards" which are style sheets which automate many of the steps in publishing.

Opening Microsoft Publisher results in a main screen with a dialogue box and four large buttons each illustrated with a symbol for Page Wizards, Templates, Blank Page and Open. Open allows an earlier document to be edited, completed or printed as required and its format will be familiar to Word For Windows users.

Selecting Blank Page allows the creation of any type of publication. The page can be zoomed from 25% to 200% actual size to allow the overall effect or the finest detail to be examined. The tool bar has nine buttons which are visually depressed and locked down when they are selected. Choosing templates allows any type of publication lay out to be created and saved as a template. This can be recalled and used as often as required when a particular style of publication is repeatedly required eg monthly newsletters. Publisher includes 24 ready made templates ready to use.

Selecting Page Wizards results in the program taking the user through a series of questions the answers to which allow Publisher to create the outline for a publication with frames for text, pictures and Word Art. Page Wizards are supplied which will create Newsletters, Calendars, Business Forms, Invitations and Greeting Cards. When the set up procedure is finished Publisher Page Wizards assemble the publication either at a "Full speed ahead captain" or slower speed which gives the novice user time to watch the process and possibly pick up short cuts etc.

Publisher has its own simple drawing functions for lines, grids, circles and ellipses, squares and rectangles etc. Pictures can be imported in a number of formats, .pcx, .tif, .eps, .bmp, .wmf and cgm which means most common formats are supported as is scanned material. The pictures can the be resized, cropped and moved or deleted as required. Almost 100 clip art images are supplied in Publisher although not all are illustrated in the manual.

Word Art gives the user the ability to create text which stretches along curves, at angles or which flows in a circle amongst many others. Word Art text can be sized, font and style can be chosen or allow the program to do it for you. A "Best Fit" option is available which I found hard to beat.

Text can be typed directly into text frames or imported from a variety of formats, ASCII, Dos Word, Word for Windows, Wordperfect, Wordstar, DOS Works and Works for Windows. As well text can be imported via the clipboard. Long files automatically overflow and can be manually or automatically flowed into other frames. Columns are supported and the number of columns can be altered at any time without losing text. The hyphenation and justification support necessary when working in columns is provided. A reasonable Spellchecker is supplied. It was interesting to note that "Microsoft", and "DTP" were among the "errors" detected when this document was checked despite its 100,000 word dictionary! Headers and Footers are available though by a rather circuitous route.

At all times an excellent Help facility is available and messages are both friendly and helpful. Page 30 of the manual is headed "Troubleshooting Like an Expert" and provides much commonsense advice, again in a friendly and easily comprehended manner which does not talk down to the user. Much advice is provided on memory management, printer support and potential problems. The program contains drivers for all common printer types and models. As well Microsoft provides a voucher for its Bitstream typeface manager which will further improve the WYSIWYG appearance of output both on screen and on the printed page.

The program allows text created in Publisher to be used in another software applications by using the "Save As" command. Another useful facility.

DISLIKES

One disadvantage of this program is the time it takes to redraw objects after they have been resized - the computer and hard disk seem to work interminably at times and I can see children being impatient with this aspect of the program.

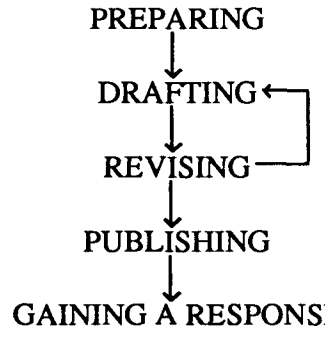
A further disadvantage lies in its inability to overflow text from one page to the next unless it is empty or has been "linked" previously. This makes it difficult to alter font size without losing text. Although the program flows text around word art and picture frames the cursor does not move around them as one would expect, nor does moving the cursor to the top of the screen result in the page scrolling .

PUBLISHER AND THE CURRICULUM

Microsoft Publisher's great strength must be in the wide range of areas and activities it is suited to in the Secondary curriculum.

In "Writing and Computers CEU 047" the writing process

is defined as



Publishing involves all of these steps. The students can prepare work using rough work plans derived from individual or group effort. Publisher can then be used to draft the first effort. Following this the individual or group revises the onscreen copy or the draft printout. When all objectives of the original brief are met the final copy is printed. This is then presented to the group, the teacher or the class as a worthwhile piece of work for display or publication eg school newspaper, class bulletin, school magazine, notice board display etc.

This approach is worthwhile as a learning experience in word processing and publishing in itself. But it assumes a far greater importance according to learning theorists who support the learning of metacognitive processes and executive control in education. They maintain learning is enhanced if "strategies are employed to develop the self-regulatory processes used by an active learner in an ongoing attempt to solve a problem by using planning , monitoring, testing, revising and evaluating strategies at all stages"(Flavell 1979).

Comparing the writing process (above) with these self regulatory processes reveals parallels which indicate that writing and publishing can become a springboard to greater educational outcomes. Research has shown that training in metacognitive processes and executive control of learning processes can lead to transfer of these skills to other areas of the curriculum.

Publisher will find a ready acceptance among teachers of the new Design and Technology Syllabus. Here their "students will use Publisher in a variety of contexts, as a stimulus for learning and as tools in their further learning".

Teachers of the Computing Studies Syllabi for Years 7 - 10 and Years 11 - 12 will find Publisher very useful in the word processing and text processing topics as well as providing a ready medium for teaching problem solving, practising metacognitive processes or for utilising group work techniques in a way which will prove both interesting and relevant to the students.

In all subjects of the Secondary curriculum there is a place for Publisher. Pupils can prepare their own resumes for Careers, prepare business forms for Commerce and Economics, prepare paper aeroplanes for Science (these are included in Publisher!), print fliers and advertising for school fund raising and so on. The list of applications of this program is limited only by the imagination of the pupils and the teacher.

PROGRAM EVALUATION

I started this review by stating that Publisher was not designed to be educational software and so does not come with a stated set of educational aims and objectives. It is a powerful tool which will find applications in many contexts in the Secondary School and is so good that it provides its own stimulus for learning in its own quality and the quality of the learning experience and the resulting output.

Publisher is a very flexible program in that it can be used to complement almost any style of teaching in almost any curriculum area. It can be used in many ways making it more useful than many very specific programs. Its use is a natural for encouraging cooperation, decision making, competition and developing the concept that people control computers and their output.

The program is user-friendly and fault tolerant with very good error trapping which should prevent the perverse student creating problems. Error messages are helpful and pleasantly in-

formative. At its very reasonable price it is streets ahead of the nearest DOS compatible opposition and negates the arguments of the pro-Macintosh groups for their favourite machine and software.

While outside of schools Publisher will not replace high end Desk Top Publishing packages such as Page-Maker and Ventura, it does result in excellent output at a very reasonable price. It will be of particular use to people whose main job is not publishing but who have a need to produce quality output quickly. without the long term effort required to learn high end DTP packages. Thus the skills involved in using Publisher will be of value to students as they leave school and enter the workforce.

Finally I wish to thank Microsoft for my copy which I won at the July Annual Conference of the CEG at Bathurst . For me it was a case of "Kids, Curriculum, Computers and Microsoft Publisher."

My school will soon be installing Microsoft Publisher on its new network, such is my opinion of it. I give this program my highest recommendation.

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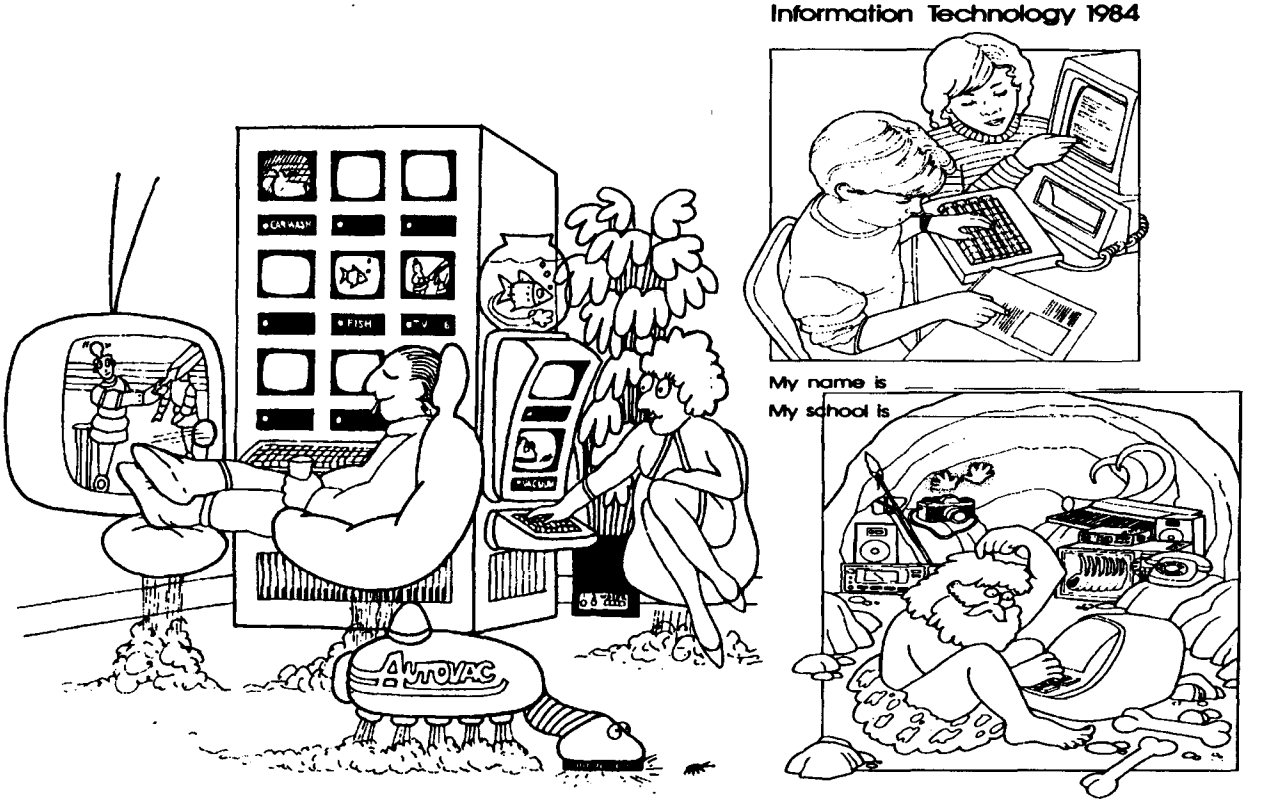
Visions of the Future- From 1982

The following illustrations are from the 1982 and 1984 workbooks distributed to students for Information Technology Week. See if you can spot the huge advances in social equity that have been made in the last decade. . . . .



Q.What do the Acorn BBC and the Apple Newton have in common?
A. Roger Wilson.

Who is Roger Wilson?

Apart from a small group of like mindsWilson is almost unknown. He is in fact the designer of the original BBC computer, writer of BBC BASIC, and major designer of the Acorn RISC machine, a 32 bit processor used in the dominant British school computer, the Archimedes.

The link with Apple is that the Newton uses ARM RISC technology, and for his work on this processor Wilson has been named Interactive Learning "Man of the Year".

Announcing the award Mr Chris Roper of Longman Logotron said "This chip will become the most widely used RISC processor in the world. Its development is now a joint process between Acorn and Apple and it will find its way into new devices around the world.

"If Clive Sinclair had never existed, we wouldn't have the C5 (pedal) car. If Alan Sugar (Amstrad) had never existed we would have been spared some truly awful computers.

"If Roger Wilson had never existed, we arguably would not have had the BBC Micro, the Acorn Archimedes, Acorn Replay or the Apple Newton, and the world would be a poorer place."

BOOK REVIEW

The Turing Option

Harry Harrison & Marvin Minskie

Harry Harrison is well known to science fiction readers for his "DeathWorld" trilogy and the light hearted "Stainless Steel Rat " series. He is known to some others as the author of quite good Bronze Age 'faction'.

Marvin Minskie is internationally known for his work on mind, as a researcher in both psychology and neurology. He has contibuted original insights into many areas of the 'what is intelligence?' argument.

Together they have written what may become one of the definitive novels involving computer technology and Artificial Intelligence.

The Turing Option referred to in the title is the test, devised by Alan Turing back in 1950 to help define 'intelligence': if two humans and a computer communicate by keyboard, randomly switched about so that at no time could either human tell if they were talking with each other or the computer, then the computer must be defined as "intelligent'- indestinguishable from human by virtue of communication skill and all that that implies.

The novel provides a wealth of background bound to send the reader looking for the source information. Does the Expert System language LAMA really exist? Just how far ahead is nanotechnology?

By virtue of plot shifts the authors do an excellent job of juxtaposing the problems of understanding human intelligence and developing machine intelligence. There appear to be many similarities and differences. A lot of material about the human brain comes up in these shifts as well, and it all makes fascinating reading. Many of the ideas expressed here are the very ones used by teachers to describe learning processes. The neurology of learning and intelligence in these sections will in fact be familiar to many teachers even if the circumstances in which they occur are fictional.

This is provides a particularly comfortable dimension to the novel, even for the teacher who may not be as interested in the AI component.

There is a bit of whimsy in the story too, as in the father taking his genius son to the lab for the first time, explaining how AI research works:

"Makes a Cray look like a beat up Macintosh."
"Really?" Brians eyes were wide as he ran his fingers along the edge of the keyboard.
"Well, not really." Paddy smiled as he rooted in his pocket for tobacco. "But it's faster in certain kinds of calculation and I really need it for the development work on LAMA. Thats a new language we're developing here."
"What's it for? "
"A new, rapidly developing and special need. You write programs in LOGO don't you?"
"Sure. And BASIC and FORTRAN- and I'm learning E out of a book. My teaching has been telling me something about Expert Systems."
"Then you will already know that different computer languages are used for different purposes. BASIC is a good first hands-on language for learning some of the simplest things computers can do- for describing procedures, step by step. FORTRAN has been used for fifty years because it is especially good for routine scientific calculations, though now it has been replaced by formula-understanding Symbolic Manipulation systems. LOGO is for beginners, particularlychildren, it is so graphical, making it easy to draw pictures."
"And it lets you write programs that write and run other programs. The others don't let you do that. They just complain when you try."
"You'll discover that you can do that in LAMA, too. Because, like LOGO, it is based on the old language LISP. One of the oldest and still one of the best- because it is simple and yet can refer back to itself. Most of the first expert systems, in the early days of artificial intelligence, were developed by using the LISP language."

So there you have it! LOGO, LISP, and AI on the same family tree.

Throughout the book there is also ubiquitous use of technology, and one of the subplots deals with personal freedom in a technology saturated world. There is also the argument of which is best- human or machine thought - for a given task, and is ma-

chine intelligence going to be any different to human intelligence anyway? Will machines lie, for example.

And finally, there is the argument about freedom of the individual versus the military-industrial-government complex.

This novel could serve as the basis of an enrichment exercise for Year 11/12 students in Computing Studies, in terms of both Technology and Social Implications.

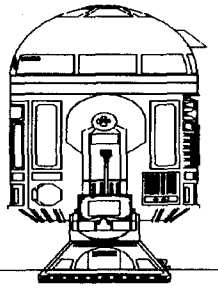
In all a thoroughly engrossing novel, which also provides much food for thought regarding the social and technology aspects of computer education.

Finally, a quote from Turing himself:

"The question, 'Can machines think?' I believe to be too meaningless to deserve discussion. Nevertheless I believe that at the end of the century the use of words and general, educated opinion will have altered so much that one will be able to speak of machines thinking without expecting to be contradicted"

Alan Turing, 1950

The Turing Option is published by Viking and costs $19.95. ISBN 0 670 83127 1



MEMBERSHIP FEE INCREASES

The Directors of the CEG have had to take the step of increasing the membership fee for 1993. There are several factors which have led to this increase, but the main one is that costs have risen over the past two years, in some cases by substantial amounts.

Unfortunately, economic constraints have hit schools and tertiary institutions, which has meant that many of the 'freebies' that the CEG enjoyed in the past are no longer possible- photocopying, mail, travel, and so on.

In addition, although our conferences have been great successes, and haven't lost money, several of our sponsors and exhibitors have been forced to restrict their support, which has meant that the financial 'buffer' is no longer as good as it once was.

Finally, the introduction of Special Interest Groups has meant a big increase in our mailing loads. This may not seem much, but consider that over 900 members means that just to get a single A4 sheet out can cost up to $1000!

Nothing is worse than paying money for no perceived return, so when the list is totalled up, just what does a member get for the financial investment in the CEG?

Consider this list:
Information Transfer (4 issues)
CEG Newsletter (4 issues)
SIG Newsletters (4-8 issues- varies)
Office fees
Affiliation with ACCE (capitation of $6in 1992, increasing in 1993)**and Joint Council**
Awards (Teacher of the year, Life Membership, International Themes)
Inservice Activities (including mini-conferences)

and this doesn't count one off items like sponsorships, or miscellaneous items such as envelopes, phone bills and so on. not a bad list in all!

In addition, the Early Bird Discount has been dropped, to be replaced with a discount voucher for those who renew their membership in time. These vouchers will be sent with 1993 membership cards, and may be redeemed against purchases or inservice courses.

1993 MEMBERSHIP FORM ON BACK COVER

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International Space Year Competition A Big Success!

The CEG sponsored poster and programming competition for the International Space Year was a popular one, attracting over 50 entries from many areas.

Most entries were from primary, and were posters. The range of equipment was interesting, going from old Microbees using Electric Paintbrush to Macintoshes.

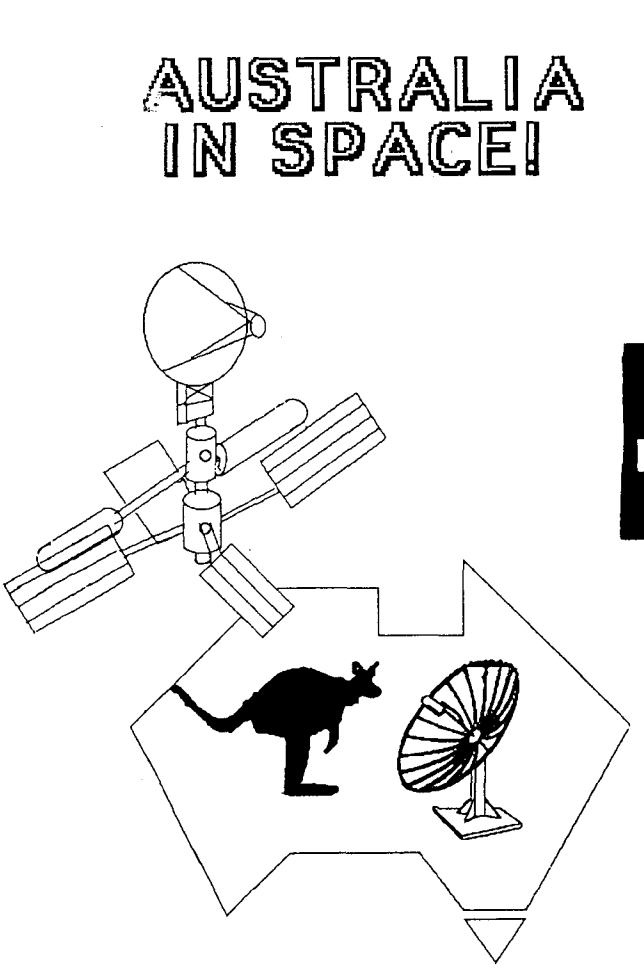
Disappointingly there was only one programming entry, which fortunately was of sufficient quality to warrant a prize.

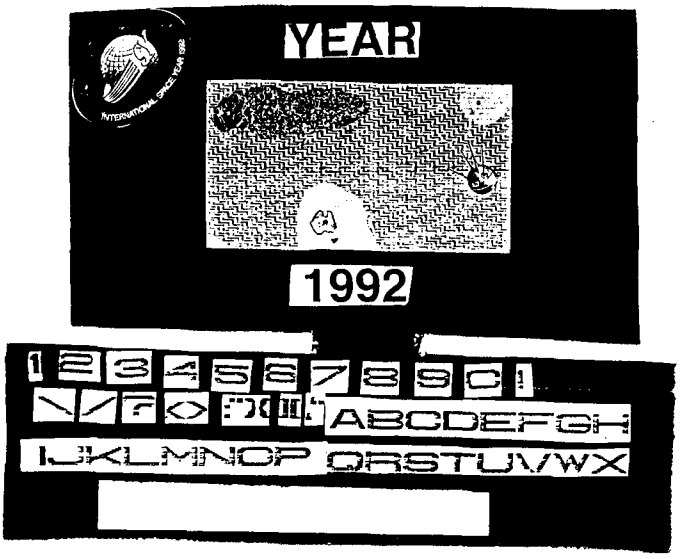
All winning entries have been given a student subscription to Sky &Space, the Australian astronomy and spaceflight magazine, as well as membership to the National Space Society of Australia.

Each school of the winners has also received subscription and membership, and all children taking part in the competition received a certificate.

Thanks to all those who took part. The winning posters are shown below.

Next year is the International Year of Indiginous Peoples, so start thinking how this might incorporate a computer perspective.






INTERNATIONAL SPACE YEAR 1992
Australia in Space
AUSTRALIA IN SPACE
SPACE
IN OUTER SPACE
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Members will receive a membership card which will serve as a receipt New members or members renewing before 30th March 1993 will receive a $10 voucher against CEG purchases (including courses & mini-conferences)